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EVALUATION OF THE SOUTHERN PINE BEETLE INFESTATIONS ON THE NATIONAL FORESTS IN MISSISSIPPI

by

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INTRODUCTION

During late July and early August 1976, the Forest Insect and Disease Management Group conducted aerial surveys and subsequent ground examinations on the Homochitto and DeSoto National Forests. The purpose of these surveys was to evaluate the status and trends of the southern pine beetle populations on the Homochitto and DeSoto National Forests.

Results of these evaluations indicated that the beetle populations were epidemic throughout the Homochitto (Bude and Homochitto Ranger Districts) and DeSoto (Chickasawhay Division) National Forests. It was estimated that over 9,607 trees were infested with southern pine beetle and that a total of 2,251 MBF of timber was affected by the southern pine beetle on both of these Forests.

METHODS

Standard aerial sketch map procedures were used for these evaluations.[2/] Aerial survey coverage was 100 percent. Spots of dead or dying trees were recorded, and those that could be accurately located were plotted on Forest Service Class A maps. Aerial survey results were corrected according to the data of Aldrich et al. (1958) to compensate for observer error.

TECHNICAL INFORMATION

Insect - Southern pine beetle, *Dendroctonus frontalis*, Zimm.

Hosts - The southern pine beetle will attack all species of southern yellow pine. However, loblolly pine, *Pinus taeda* L., and shortleaf pine, *P. echinata* Mill., are the preferred hosts.

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2/ Detection of Forest Pests in the Southeast. 1970. USDA, USFS, SA, S&PF, Div. of FPM, Publ. S&PF-7, Atlanta, Ga. 51 p.

Type of Damage - Death of the tree is the result of cambial mining by the southern pine beetle as it constructs its gallery. The beetle also introduces blue stain fungi, *Ceratocystis* spp., which slow down or block conduction of water in the stem.

Life Cycle of the Beetle - The beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark for pupation. The callow adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer and as many as seven generations may be produced in a year.

RESULTS AND DISCUSSION

Homochitto National Forest

Data from the aerial surveys and subsequent ground examinations are summarized in Tables 1 and 2. These data indicated a high level of southern pine beetle activity on both the Bude Ranger District and the Homochitto Ranger District. Spots were well scattered over the Forest and ranged in size from 1-150 trees. A comparison of data from the previous survey (February 1976) showed that the total number of infested trees on the Bude Ranger District decreased from 8,729 to 2,212; the total number of infested trees on the Homochitto Ranger District remained about the same, approximately 5,739 infested trees. Infested trees/M acres of host type on the Bude and Homochitto Ranger Districts were 17.5 and 46.3 respectively.

DeSoto National Forest

Chickasawhay Division

Results of this evaluation are summarized in Tables 1 and 2. Low levels of southern pine beetle were first observed on the Chickasawhay Division, DeSoto National Forest, Mississippi, in late January 1976. Since then, the southern pine beetle has become epidemic with the total corrected number of spots increasing from 84 in January 1976 to over 241 spots in August 1976. Infested trees/M acres of host type increased from 1.7 to 13.8 and the total number of infested trees from 200 to 1,655. Total volume affected exceeded 204.5 MBF.

Systems for accurately predicting southern pine beetle population trends are being developed. For the present, current population status adjusted by entomological and operational experience serve

Table 1. Summary of results of southern pine beetle evaluation conducted on the National Forests in Mississippi, August 1976

	Ownership		
	Homochitto N.F.		DeSoto N.F.
	Bude R.D.	Homochitto R.D.	Chickasawhay R.D.
	FY 1976		
1. Results compiled from data collected during the aerial phase of the evaluation:			
Survey type	----------	Aerial Sketch Map	----------
Date of survey	8/4/76	8/9/76 2/ 3/	7/30/76
Percent survey	----------	100 percent	----------
Total acreage surveyed	188,407	185,090	150,120
Total susceptible host type acreage	126,232	124,010	120,000
Total number of spots on Forest Service lands	328.4	1125.0	241.0
Spots per M acres of host type	2.6	9.1	2.0
Average spot size (trees)	7.0	3.04	3.38
Range of spot sizes (trees)	1-100	1-150	1-40
Reds and Faders/M acres host type	18.3	27.6	6.8
2. Results compiled from data collected during the ground and aerial phases of the evaluation:			
Date of ground phase	8/10/76	8/10/76	8/9/76
Infested trees/M acres of host type	17.5	46.3	13.8
Total number of infested trees	2212.9	5739.0	1655.0
Ratio of green infested to total red and fading trees	.78:1	1.68:1	1.25:1
Total volume of infested trees (MBF)	246.6	838.0	173.8
Total volume of affected trees (MBF) 1/	564.8	1481.3	204.5

1/ Affected volume includes all trees (grey, red, fading, green) that are dead or dying as a result of southern pine beetle.

2/ Supplemental aerial survey flown on 8/23/76.

3/ Total number of spots within survey boundary.

Table 2. Summary of spot data from aerial survey, southern pine beetle evaluation, Homochitto National Forest and DeSoto National Forest, Mississippi, August 1976

Ownership	Singles	Spot Size (No. Trees)[1/] 2-5 Spots:Trees	6-20 Spots:Trees	21-50 Spots:Trees	50-100 Spots:Trees	100+ Spots:Trees	Total Spots:Trees	Avg. Multiple Tree-Spot Size
Homochitto N,F.								
Bude R.D.	168	79 - 257	52 - 598	23 - 765	6 - 517	0 - 0	328 - 2796	16.4
Homochitto R.D.[2/]	856	195 - 584	46 - 499	19 - 641	7 - 536	2 - 300	1125 - 3416	9.5
TOTAL Homochitto N.F.	1024	274 - 841	98 -1097	42 -1406	13 -1053	2 - 300	1453 - 6212	13.0
DeSoto N.F.	161	49 - 137	23 - 301	8 - 216	0 - 0	0 - 0	241 - 815	8.2

[1/] Data corrected according to Aldrich et al. (1958).

[2/] Includes both federal and non-federal lands within Ranger District protection boundaries.

as a basis for making broad estimates of future population trends. This insect has a high biotic potential, and when conditions are favorable for its development, rapid population increases can occur that could result in widespread and extensive timber losses. On the Chickasawhay Division of the DeSoto National Forest, the southern pine beetle population appears to be on the increase. The potential presently exists for more extensive losses this fall and next spring.

RECOMMENDATIONS

1. It is recommended that southern pine beetle suppression be continued on both the Homochitto and DeSoto National Forests.

2. Emphasis should be placed on controlling the larger spots in areas of heaviest infestation.

3. All control efforts should be carried out in accordance with guidelines set forth in FSM 5250, SA Supplement No. 8, and the Homochitto and DeSoto National Forest Southern Pine Beetle Project Control Plan.

4. Suppression efforts should be accelerated as necessary to cope with the increasing beetle populations.

REFERENCES

1. Aldrich, R. C., R. C. Heller and W. F. Bailey. 1958. Observation limits for aerial sketch mapping southern pine beetle damage in the southern Appalachians. J. For. 56(3):200-203.